What is claimed is:

1. A method for forming a film comprising:

a first process, wherein:

a discharge gas is supplied to a first discharge space where high frequency electric field A is generated at or near atmospheric pressure, whereby the discharge gas is excite;

energy of the excited discharge gas is transferred to a film forming gas, whereby the film forming gas is excited; and

a substrate is exposed to the exited film forming gas to form a film on the substrate, and

a second process, wherein:

a gas containing an oxidizing gas is supplied to a second discharge space where high frequency electric field B is generated at or near atmospheric pressure, whereby the gas containing the oxidizing gas is excite; and

the film formed in the first process is exposed to the excited gas containing the oxidizing gas.

2. A method for forming a film comprising:

a first process, wherein:

a discharge gas is supplied to a first discharge space where high frequency electric field A is generated at or near atmospheric pressure, whereby the discharge gas is excite;

a film forming gas is put in contact with the excited discharge gas; and

a substrate is exposed to the film forming gas put in contact with the excited discharge gas to form a film on the substrate, and

a second process, wherein:

a gas containing an oxidizing gas is supplied to a second discharge space where high frequency electric field B is generated at or near atmospheric pressure, whereby the gas containing the oxidizing gas is excite; and

the film formed in the first process is exposed to the excited gas containing the oxidizing gas.

3. A method for forming a film comprising:

a first process, wherein:

gas 1 containing a film forming gas is supplied to a first discharge space where high frequency electric field A is generated at or near atmospheric pressure, whereby gas 1 is excite; and

a substrate is exposed to exited gas 1 to form a film on the substrate, and

a second process, wherein:

gas 2 containing a oxidizing gas is supplied to a second discharge space where high frequency electric field B is generated at or near atmospheric pressure, whereby gas 2 is excite;

the film formed in the first process is exposed to excited gas 2 containing the oxidizing gas.

4. The method of claim 3, wherein:

high frequency electric field A is formed by superposing a first high frequency electric field and a second high frequency electric field;

gas 1 contains a discharge gas and a reducing gas in addition to the film forming gas; and

the discharge gas contains nitrogen of which content is 50 % by volume or more based on a volume of the discharge gas.

5. The method of claim 4, wherein the reducing gas is hydrogen.

6. The method of claim 3, wherein:

a discharge space of the first process is formed between a first electrode and a second electrode which are facing each other; and

the first high frequency electric field is applied by the first electrode and the second high frequency electric field is applied by the second electrode.

7. The method of claim 3, wherein:

a frequency of the second high frequency electric field $\omega 2$ is higher than a frequency of the first high frequency electric field $\omega 1$;

intensity of the first high frequency electric field V1, intensity of the second high frequency electric field V2, and intensity of discharge starting electric field IV1 satisfy one of the formulas:

$V1 \geq IV1 > V2$ and $V1 > IV1 \geq V2$; and

a power density of the second high frequency electric field is not less than 1 W/cm^2.

8. The method of claim 7, wherein:

high frequency electric field B is formed by superposing a third high frequency electric field and a fourth high frequency electric field.

9. The method of claim 8, wherein:

a discharge space of the second process is formed between a third electrode and a fourth electrode which are facing each other; and

the third high frequency electric field is applied by the third electrode and the fourth high frequency electric field is applied by the fourth electrode.

10. The method of claim 3, wherein the first electrode and the third electrode are common.

11. The method of claim 8, wherein:

a frequency of the fourth high frequency electric field $\omega 4$ is higher than a frequency of the third high frequency electric field $\omega 3$;

intensity of the third high frequency electric field V3, intensity of the fourth high frequency electric field V4, and intensity of discharge starting electric field IV2 satisfy one of the formulas:

$V3 \geq IV2 > V4$ and $V3 > IV2 \geq V4$; and

a power density of the fourth high frequency electric field is not less than $1W/cm^2$.

12. The method of claim 3, wherein the film is a metal oxide film.

13. The method of claim 3, wherein the film is a transparent conductive film.

14. The method of claim 3, wherein the film forming gas contains an organo-metallic compound having a metal atom selected from the group consisting of indium(In), tin(Sn), zinc(Zn), zirconium(Zr), antimony(Sb), aluminum(Al), gallium(Ga) and germanium(Ge).

15. The method of claim 3, wherein the first process and the second process are alternately repeated a plurality of times.

16. The method of claim 3, wherein a thickness of the accumulated film in the first process per batch is not more than 10 nm.

17. A method for forming a film comprising:

a first process, wherein:

gas 1 containing a film forming gas is supplied to a discharge space at or near atmospheric pressure;

high frequency electric field A is applied to the discharge space, whereby gas 1 is excited; and

a substrate is exposed to excited gas 1 to form a film on the substrate,

wherein

high frequency electric field A is formed by superposing a first high frequency electric field and a second high frequency electric field;

a frequency of the first high frequency electric field represented by $\omega 1$ is high than a frequency of the second high frequency electric field represented by $\omega 2$;

intensity of the first high frequency electric field represented by V1, intensity of the second high frequency electric field represented by V2, and intensity of discharge starting electric field represented by IV1 satisfy one of the following formulas:

$V1 \geq IV1 > V2$ and $V1 > IV1 \geq V2$;

a power density of the second high frequency electric field is not less than 1 W/cm^2;

gas 1 contains a reducing gas and 50 % by volume or more of nitrogen gas based on a volume of a discharge gas in addition to the film forming gas; and

the film forming gas contains an organo-titanium compound, and

a second process, wherein

gas 2 containing an oxidizing gas is supplied to a discharge space at or near atmospheric pressure;

high frequency electric field B is applied to the discharge space, whereby gas 2 is excited; and

a substrate having thereon a film formed by gas 1 is exposed to exited gas 2.

18. The method of claim 17, wherein the reducing gas is hydrogen.

19. The method of claim 17, wherein

the discharge space of the first process is formed between a first electrode and a second electrode which are facing each other; and

the first high frequency electric field is applied by the first electrode and the second high frequency electric field is applied by the second electrode.

20. The method of claim 17, wherein:

high frequency electric field B is formed by superposing a third high frequency electric field and a fourth high frequency electric field.

21. The method of claim 20, wherein:

the discharge space of the second process is formed between a third electrode and a fourth electrode which are facing each other; and

the third high frequency electric field is applied by the third electrode and the fourth high frequency electric field is applied by the fourth electrode.

22. The method of claim 17, wherein the first electrode and the third electrode are common.

23. The method of claim 20, wherein:

a frequency of the fourth high frequency electric field $\omega 4$ is higher than a frequency of the third high frequency electric field represented by $\omega 3$;

intensity of the third high frequency electric field V3, intensity of the fourth high frequency electric field V4,

and intensity of discharge starting electric field IV2 satisfy one of the following formulas:

$V3 \geq IV2 > V4$ and $V3 > IV2 \geq V4$; and

a power density of the fourth high frequency electric field is not less than 1 W/cm^2.

24. The method of claim 17, wherein the first process and the second process are alternately repeated a plurality of times.

25. The method of claim 17, wherein a thickness of the film accumulated in the first process per time is not more than 20 nm.

26. A substrate having thereon the film formed by the method of claim 3.